

CLAIMS

- 5 1. An electronic device cooling apparatus comprising:
a primary cooling unit which is disposed in close proximity
with an electronic device so as to face a surface thereof;
an auxiliary cooling unit which is disposed in close
proximity with the electronic device so as to face a surface
10 thereof; and
a controller which drives at least one of the primary cooling
unit and the auxiliary cooling unit so as to cool the electronic
device.
- 15 2. The electronic device cooling apparatus according to
claim 1, wherein the primary cooling unit is based on a cooling
mechanism different from that of the auxiliary cooling unit.
- 20 3. The electronic device cooling apparatus according to
claim 1, wherein the cooling capacity of the auxiliary cooling
unit per unit time is higher than that of the primary cooling unit.
- 25 4. The electronic device cooling apparatus according to any
one of claims 1 through 3, wherein the auxiliary cooling unit faces
a surface of the electronic device different from a surface that
the primary cooling unit faces.

5. The electronic device cooling apparatus according to any one of claims 1 through 4, wherein the auxiliary cooling unit is provided with a cooling nozzle, and

5 the controller controls a coolant introduced in the cooling nozzle and drives the auxiliary cooling unit by delivering a jet of coolant from the cooling nozzle.

6. The electronic device cooling apparatus according to any
10 one of claims 1 through 5, further comprising a temperature measuring unit which measures the temperature of a surface of the electronic device, wherein

when a rise in the measured temperature per unit time exceeds a predetermined threshold value, the controller drives the
15 auxiliary cooling unit to cool the electronic device.

7. An electronic device cooling apparatus comprising:
a primary cooling unit which is disposed in close proximity with an electronic device so as to face a predetermined surface
20 thereof;

an auxiliary cooling unit which delivers a jet of coolant to the electronic device via a through hole provided in a substrate that faces a surface of the electronic device different from the predetermined surface; and

25 a controller which drives at least one of the primary cooling unit and the auxiliary cooling unit so as to cool the electronic

device.

8. An electronic device cooling apparatus comprising:

5 a heat dissipating mechanism which is disposed in close proximity with an electronic device so as to face a predetermined surface thereof and which dissipates heat generated from the predetermined surface;

10 an auxiliary cooling unit which delivers a jet of coolant to the electronic device via a through hole provided in a substrate that faces a surface of the electronic device different from the predetermined surface; and

a controller which drives the auxiliary cooling unit so as to cool the electronic device.

15 9. An electronic device cooling method comprising:
measuring the temperature of a surface of an electronic device;

determining whether a rise in the temperature of the surface of the electronic device per unit time exceeds a predetermined
20 threshold value as a result of time variation; and

spraying the electronic device with a jet of coolant when the rise exceeds the threshold value.

10. An electronic device cooling method comprising:

25 measuring the temperature of a surface of an electronic device;

determining whether the measured temperature exceeds a first predetermined threshold value;

cooling the surface of the electronic device by a first cooling unit when the measured temperature exceeds the first
5 predetermined threshold value;

determining whether a rise in the temperature of the surface of the electronic device per unit time exceeds a second predetermined threshold value as a result of time variation; and

cooling the surface of the electronic device by a second
10 cooling unit when the rise exceeds the second predetermined threshold value.

11. A computer program product for controlling the cooling of an electronic device, comprising:

15 a measuring module which measures the temperature of a surface of the electronic device;

a determining module which determines whether a rise in the temperature of the surface of the electronic device per unit time exceeds a predetermined threshold value as a result of time
20 variation; and

a driving module which drives a cooling nozzle when the rise exceeds the predetermined threshold value so as to deliver a jet of coolant to the electronic device.

25 12. A computer program product for controlling the cooling of an electronic device, comprising: a measuring module which

measures the temperature of a surface of the electronic device;

a first determining module which determines whether the measured temperature exceeds a first predetermined threshold value;

5 a first cooling module which causes a first cooling unit to cool the surface of the electronic device when the measured temperature exceeds the first predetermined threshold value;

a second determining module which determines whether a rise in the temperature of the surface of the electronic device per
10 unit time exceeds a second predetermined threshold value as a result of time variation; and

a second cooling module which causes a second cooling unit to cool the surface of the electronic device when the rise exceeds the second predetermined threshold value.

15

13. A computer readable recording medium having embodied thereon a computer program product for controlling the cooling of an electronic device, the computer program product comprising:

a measuring module which measures the temperature of a
20 surface of the electronic device;

a determining module which determines whether a rise in the temperature of the surface of the electronic device per unit time exceeds a predetermined threshold value as a result of time variation; and

25 a driving module which drives a cooling nozzle when the rise exceeds the predetermined threshold value so as to deliver a jet

of coolant to the electronic device.

14. A computer readable recording medium having embodied thereon a computer program product for controlling the cooling
5 of an electronic device, the computer program product comprising:

a measuring module which measures the temperature of a surface of the electronic device;

a first determining module which determines whether the measured temperature exceeds a first predetermined threshold
10 value;

a first cooling module which causes a first cooling unit to cool the surface of the electronic device when the measured temperature exceeds the first predetermined threshold value;

a second determining module which determines whether a rise
15 in the temperature of the surface of the electronic device, per unit time exceeds a second predetermined threshold value as a result of time variation; and

a second cooling module which causes a second cooling unit to cool the surface of the electronic device when the rise exceeds
20 the second predetermined threshold value.